

Appl. No. 10/812,369
Amtd. Dated January 30, 2007
Reply to Office action of October 30, 2006

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Remarks:

Claims 1-37 were originally filed in the application. Claims 15, 16, and 19-37 were withdrawn from consideration, by way of a Response to a Restriction Requirement filed August 23, 2006.

Claims 1-14 and 19-18 are currently pending in the application. Claims 1-5, 11-12, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,476,609 ("Bittar") in view of U.S. Patent No. 6,975,120 ("Amini") or U.S. Patent No. 6,727,705 ("Frey"), or U.S. Patent No. 6,957,708 ("Chemali"). Claims 6-14 and 18 are rejected under 35 USC 103(a) as being unpatentable over Bittar in view of Amini or Frey or Chemali, and further in view of U.S. Publication No. 2003/0055565 ("Omeragic"). With submission of this Response and entry of the amendments, claims 1, 4-5, 8-14, and 17-18 will remain pending.

Independent claim 1 has been amended to recite a resistivity imaging tool having, among other elements, a transmitter and a receiver wherein each transmitter and receiver comprises two antennas with their axes substantially orthogonal to one another, the transmitter antennas and receiver antennas being arranged in the same orthogonal directions. For purposes of these present Remarks and only for convenience, such a pair of transmitter and receiver having the above-recited properties shall be referred to as a crossed magnetic dipole transmitter and receiver pair.

Amended claim 1 further recites that the receiver is disposed on the body a distance of two inches (6cm) or less from the transmitter. Chemali describes a transmitter-receiver spacing that can be 9.5 cm, which is outside the range recited in amended claim 1. See col. 7, lines 27-29. Chemali suggests, however, that the separation cannot or should not be less than the specified range as "[i]t is desirable to have the distance between transmitters and receivers large compared to the thickness of the mud layer." See col. 7, lines 20-23. Thus, Chemali appears to teach away from reducing the separation thickness further and consequently, from the arrangement recited in claim 1.

Amini (or Frey) is cited as disclosing the principle that "spacing between transmitters and receivers is proportional to the depth of penetration or investigation." Applicants do not dispute that this general principle is known. This general principle does not disclose, however, the specific arrangement of claim 1. Neither Amini (or Frey) nor Chemali teaches or suggests that

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the spacing between a crossed dipole transmitter and receiver pair can be within the range recited in claim 1, or if so, how such an arrangement could be achieved. Accordingly, it would have been much more than a matter of design choice to dispose a crossed magnetic dipole transmitter and receiver pair such that the transmitter-receiver spacing is two inches or less.

Amended claim 1 further recites that the transmitter and receiver are both disposed in an insulating material within a cavity. Although Bittar is cited as disclosing transmitter and receivers being mounted in recesses and covered with insulation, none of the references describes the transmitter and receiver as being disposed in the same insulating material within the same cavity. Applicants submit that the prior art taught away from disposing transmitter and receivers in the same cavity (and from a spacing of two inches or less) due to the complexity of the transmitter and receiver antenna structures and of the operation of the crossed magnetic dipole transmitter and receiver pair, especially for a resistivity imaging tool. Modifying any of the structure or arrangement disclosed in the cited references to replicate the structure and arrangement of claim 1 would have been a new technical challenge for which a solution was not available in the prior art.

Applicants note that neither Bittar nor Omeragic provide additional teachings that would serve to cure the deficiencies of the Amini, Frey, and Chemali references, as discussed above. More specifically, none of these other references teaches the transmitter-receiver spacing or a crossed magnetic dipole transmitter and receiver pair disposed in insulating material within a cavity, as recited in claim 1.

Accordingly, the resistivity imaging tool of amended claim 1 is patentable over the cited references. Furthermore, each of dependent claims 4-5, 8-14, and 17-18 is also patentable over the cited references.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance.

No fee is believed to be due at this time. If the appropriate Petition for an Extension of Time is not attached hereto (or any other Petition required of the application), this statement shall serve as Applicants' Petition to the U.S.P.T.O. The Commissioner is hereby authorized to charge any additional fees or credit any overpayments related to this response to Deposit Account No. 190610 (24.0852US).

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The undersigned is available for consultation at any time, if the Examiner believes such consultation may expedite the resolution of any issues.

Respectfully submitted,

Date: 01/30/2007


Alberto Q. Amatong, Jr.
Registration No. 41,580
Morris & Amatong, P.C.
10260 Westheimer, Suite 360
Houston, Texas 77042-3110
Telephone: (713) 334-5151
Facsimile: (713) 334-5157
ATTORNEY FOR APPLICANTS